

CLAIM AMENDMENT

Listing of Claims

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) A method for increasing the level of at least one 4'-*O*-methylated isoflavonoid compound in a target legume plant comprising transforming said target legume plant with a DNA encoding fragment of an isoflavone *O*-methyltransferase gene, wherein said DNA gene encodes the polypeptide encoded by SEQ ID NO:1 and/or comprises SEQ ID NO:1 or a sequence that exhibiting hybridization with SEQ ID NO:1 under wash conditions of 0.2 x SSC, 0.1 % SDS at 65 °C 42°C, to form a transgenic wherein the plant exhibits increased levels of at least one 4'-*O*-methylated isoflavonoid compound and over-expressing said gene in said transgenic plant under the control of a suitable constitutive or inducible promoter.
2. (Original) The method of claim 1, wherein said compound is a 4'-*O*-methylated isoflavonoid phytoalexin.
3. (Original) The method of claim 1, wherein said compound is a 4'-*O*-methylated isoflavonoid nutraceutical.
- 4 - 5. (Canceled)
6. (Currently amended) A method of producing at least one 4'-*O*-methylated isoflavonoid compound in a target legume plant that does not produce said 4'-*O*-methylated isoflavonoid compound comprising transforming said target legume plant with a DNA encoding fragment of an isoflavone *O*-methyltransferase gene, wherein said DNA gene encodes the polypeptide encoded by SEQ ID NO:1 and/or comprises SEQ ID NO:1 or a sequence that exhibiting hybridization with

SEQ ID NO:1 under wash conditions of 0.2 x SSC, 0.1 % SDS at 65 °C42°C, to form a transgenic plant producing at least one 4'-O-methylated isoflavonoid compound~~and expressing said isoflavone O-methyltransferase gene in said transgenic plant under the control of a suitable constitutive or inducible promoter, said transgenic plant containing all the other necessary enzymes of isoflavonoid biosynthesis to produce said 4'-O-methylated isoflavonoid compound.~~

7. (Original) The method of claim 6, wherein said compound is a 4'-O-methylated isoflavonoid phytoalexin.
8. (Original) The method of claim 6, wherein said compound is a 4'-O-methylated isoflavonoid nutraceutical.
9. (Currently amended) The method of claim 6, wherein the native DNA of said target plant encodes all the necessary enzymes of isoflavonoid biosynthesis other than isoflavone O-methyltransferase to produce said 4'-O-methylated isoflavonoid compound~~said enzymes.~~
10. (Currently amended) The method of claim 6, wherein said target plant is genetically transformed~~erred~~ to encode for at least one said enzyme of isoflavonoid biosynthesis other than isoflavone O-methyltransferase.
- 11 - 14. (Canceled)
15. (Withdrawn) A method for producing at least one 4'-O-methylated isoflavonoid nutraceutical in non-plant cell system by expression of a DNA fragment comprising an isoflavone O-methyltransferase gene under the control of a suitable constitutive or inducible promoter in cells that have been genetically transformed to contain all the other necessary enzymes of isoflavonoid biosynthesis to make said 4'-O-methylated isoflavonoid nutraceutical.

16. (Withdrawn) The method of claim 15, wherein said fragment comprises SEQ ID NO:1.
17. (Withdrawn) The method of claim 15, wherein said fragment comprises a sequence exhibiting at least moderate hybridization with SEQ ID NO:1.
18. (Withdrawn) A method for decreasing the levels of formononetin, at least one of its conjugates or mixtures thereof in a transgenic forage legume comprising antisense expression, sense gene-mediated silencing, or nucleic acid-mediated insertional inactivation of a DNA fragment comprising an isoflavone *O*-methyltransferase gene under the control of a suitable constitutive or inducible promoter.
19. (Withdrawn) The method of claim 18, wherein said fragment comprises SEQ ID NO:1.
20. (Withdrawn) The method of claim 18, wherein said fragment comprises a sequence exhibiting at least moderate hybridization with SEQ ID NO:1.
21. (Withdrawn) The method of claim 18, 19 or 20, wherein said legume is alfalfa.
22. (Withdrawn) A method for decreasing the level of at least one 4'-*O*-methylated isoflavonoid compound in a target plant having all the necessary enzymes for synthesizing said 4'-*O*-methylated isoflavonoid compound comprising transforming said target plant with a DNA fragment comprising an isoflavone *O*-methyltransferase gene to form a transgenic plant and inducing antisense expression, sense gene-mediated silencing, or nucleic acid-mediated insertional inactivation of said isoflavone *O*-methyltransferase gene under the control of a suitable constitutive or inducible promoter.
23. (Withdrawn) The method of claim 22, wherein said compound is selected from the group consisting of a 4'-*O*-methylated isoflavonoid phytoalexin, a 4'-*O*-methylated isoflavonoid phytoalexin conjugate and mixtures thereof.

24. (Withdrawn) The method of claim 22 or 23, wherein said fragment comprises SEQ ID NO:1.
25. (Withdrawn) The method of claim 22 or 23, wherein said fragment comprises a sequence exhibiting at least moderate hybridization with SEQ ID NO:1.
26. (Withdrawn) A method for decreasing the level of at least one 4'-*O*-methylated isoflavonoid nutraceutical, at least 4'-*O*-methylated isoflavonoid nutraceutical or mixtures thereof in a target plant having all the necessary enzymes for synthesizing said 4'-*O*-methylated isoflavonoid nutraceutical or said conjugate comprising transforming said target plant with a DNA fragment comprising an isoflavone *O*-methyltransferase gene to form a transgenic plant and inducing antisense expression or sense gene-mediated silencing of said isoflavone *O*-methyltransferase gene under the control of a suitable constitutive or inducible promoter, thereby increasing the level of the corresponding non-methylated precursor, its conjugate or mixture thereof.
27. (Withdrawn) The method of claim 26, wherein said fragment comprises SEQ ID NO:1.
28. (Withdrawn) The method of claim 26, wherein said fragment comprises a sequence exhibiting at least moderate hybridization with SEQ ID NO:1.
29. (Withdrawn) A method for the production of a 7-*O*-methylated isoflavonoid compound comprising contacting intact plants or cell suspension cultures with a non-methylated isoflavone precursor of said 7-*O*-methylated isoflavonoid compound, said intact plants or cell suspension cultures transformed with a DNA fragment comprising an isoflavone *O*-methyltransferase gene under the control of a suitable constitutive or inducible promoter.
30. (Withdrawn) The method claim 29, wherein said fragment comprises SEQ ID NO:1.

31. (Withdrawn) The method of claim 29, wherein said fragment comprises a sequence exhibiting at least moderate hybridization with SEQ ID NO:1.
32. (Withdrawn) A method for the production of a 7-*O*-methylated isoflavonoid compounds comprising contacting a soluble or immobilized isoflavone *O*-methyltransferase enzyme with a non-methylated isoflavone precursor to said 7-*O*-methylated isoflavonoid compound, wherein said enzyme is produced by the expression of a DNA fragment encoding the isoflavone *O*-methyltransferase gene in transgenic plants, transfected yeast, or transfected insect cells.
33. (Withdrawn) The method of claim 32, wherein said fragment comprises SEQ ID NO:1.
34. (Withdrawn) The method of claim 32, wherein said fragment comprises a sequence exhibiting at least moderate hybridization with SEQ ID NO:1.
35. (Withdrawn) A method to detect 4'-*O*-methyltransferase comprising the steps of
- preparing tissue that may have 4'-*O*-methyltransferase;
 - incubating said tissue with a first antibody that binds 4'-*O*-methyltransferase;
 - removing said antibody that did not bind to said tissue; and
 - incubating said tissue with a second antibody that binds said first antibody, said second antibody being detectably labeled.
36. (Currently amended) A method of increasing disease resistance in a target legume plant comprising transforming said target legume plant with a DNA ~~encoding fragment of an~~ isoflavone *O*-methyltransferase ~~gene~~, wherein said DNA gene encodes the polypeptide encoded by SEQ ID NO:1 and/or comprises SEQ ID NO:1 or a sequence that exhibiting hybridization with SEQ ID NO:1 under wash conditions of 0.2 x SSC, 0.1 % SDS at 65 °C 42 °C, wherein said transformed plant exhibits increased disease resistance levels of at

~~least one 4'-O-methylated isoflavonoid when compared to levels of said 4'-O-methylated isoflavonoid in plants of the same species which do not comprise said DNA fragment.~~

37 -- 38.(Canceled)

39. (Withdrawn) In a composition comprising at least one 4'-O-methylated isoflavonoid suitable for administration as a foodstuff, a nutritional supplement, an animal feed supplement, a nutraceutical, or a pharmaceutical, the improvement comprising 4'-O-methylated isoflavonoid isolated from at least a portion of a transgenic plant transformed with a DNA fragment comprising an isoflavone O-methyltransferase gene, wherein said transgenic plant exhibits increased levels of said 4'-O-methylated isoflavonoid when compared to levels of said 4'-O-methylated isoflavonoid in plants of the same species which do not comprise said DNA fragment.
40. (Withdrawn) The composition of claim 39, wherein said fragment comprises SEQ ID NO:1.
41. (Withdrawn) The composition of claim 39, wherein said fragment comprises a sequence exhibiting at least moderate hybridization with SEQ ID NO:1.
42. (Withdrawn) The composition of claim 39, 40 or 41, wherein said transgenic plant is a legume.
43. (Currently amended) A transgenic legume plant comprising at least one recombinant DNA sequence encoding ~~an~~ isoflavone O-methyltransferase gene, wherein said gene DNA encodes the polypeptide encoded by SEQ ID NO:1 and/or comprises SEQ ID NO:1 or a sequence that exhibiting hybridization with SEQ ID NO:1 under wash conditions of 0.2 x SSC, 0.1 % SDS at 65 °C 42°C, wherein said transgenic legume plant upon expression of said DNAgene exhibits increased levels of ~~said 4'-O-methylated isoflavonoid compounds~~ when compared to levels of said 4'-O-methylated isoflavonoid compounds in plants of

the same species which do not comprise said recombinant DNA sequence.

44. (Currently amended) Seed from a transgenic legume plant comprising at least one recombinant DNA sequence encoding an isoflavone *O*-methyltransferase ~~gene~~, wherein said DNAgene encodes the polypeptide encoded by SEQ ID NO:1 and/or comprises SEQ ID NO:1 or a sequence that exhibiting hybridization with SEQ ID NO:1 under wash conditions of 0.2 x SSC, 0.1 % SDS at 65 °C 42°C, wherein said seed comprises the recombinant DNA and wherein said plant upon expression of said DNAgene exhibits increased levels of 4'-*O*-methylated isoflavonoid compounds when compared to levels of said 4'-*O*-methylated isoflavonoid compounds in plants of the same species which do not comprise said recombinant DNA sequence.
45. (Currently amended) Progeny from a transgenic plant comprising at least one recombinant DNA sequence encoding an isoflavone *O*-methyltransferase gene, wherein said DNAgene encodes the polypeptide encoded by SEQ ID NO:1 and/or comprises SEQ ID NO:1 or a sequence that exhibiting hybridization with SEQ ID NO:1 under wash conditions of 0.2 x SSC, 0.1 % SDS at 42°C, wherein said progeny comprises the recombinant DNA, and wherein said plant upon expression of said DNAgene exhibits increased levels of 4'-*O*-methylated isoflavonoid compounds when compared to levels of said 4'-*O*-methylated isoflavonoid compounds in plants of the same species which do not comprise said recombinant DNA sequence.
46. (Currently amended) Progeny from seed of a transgenic legume plant comprising at least one recombinant DNA sequence encoding ~~an~~ isoflavone *O*-methyltransferase ~~gene~~, wherein said DNAgene encodes the polypeptide encoded by SEQ ID NO:1 and/or comprises SEQ ID NO:1 or a sequence that exhibiting hybridization with SEQ ID NO:1 under wash conditions of 0.2 x SSC, 0.1 % SDS at 65 °C 42°C, wherein said progeny comprises the recombinant DNA, and wherein said plant upon expression of said DNAgene exhibits increased levels of

4'-*O*-methylated isoflavonoid compounds when compared to levels of said 4'-*O*-methylated isoflavonoid compounds in plants of the same species which do not comprise said recombinant DNA sequence.

47. (Withdrawn) A transgenic plant comprising at least one recombinant DNA sequence encoding a portion of an isoflavone *O*-methyltransferase gene, wherein said plant upon expression of said gene exhibits decreased levels of 4'-*O*-methylated isoflavonoid compounds when compared to levels of said 4'-*O*-methylated isoflavonoid compounds in plants of the same species which do not comprise said recombinant DNA sequence.
48. (Withdrawn) Seed from a transgenic plant comprising at least one recombinant DNA sequence encoding a portion of an isoflavone *O*-methyltransferase gene, wherein said plant upon expression of said gene exhibits decreased levels of 4'-*O*-methylated isoflavonoid compounds when compared to levels of said 4'-*O*-methylated isoflavonoid compounds in plants of the same species which do not comprise said recombinant DNA sequence.
49. (Withdrawn) Progeny from a transgenic plant comprising at least one recombinant DNA sequence encoding a portion of an isoflavone *O*-methyltransferase gene, wherein said plant upon expression of said gene exhibits decreased levels of 4'-*O*-methylated isoflavonoid compounds when compared to levels of said 4'-*O*-methylated isoflavonoid compounds in plants of the same species which do not comprise said recombinant DNA sequence.
50. (Withdrawn) Progeny from seed of a transgenic plant comprising at least one recombinant DNA sequence encoding a portion of an isoflavone *O*-methyltransferase gene, wherein said plant upon expression of said gene exhibits decreased levels of 4'-*O*-methylated isoflavonoid compounds when compared to levels of said 4'-*O*-methylated isoflavonoid compounds in plants of the same species which do not comprise said recombinant DNA sequence.

RESPONSE TO OFFICE ACTION**A. Status of the Claims**

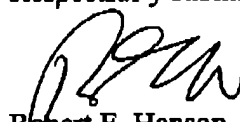
Claims 1-3, 6-10, 36 and 43-46 were pending at the time of the Action. Claims 1, 6, 9, 10, 36, and 43-46 have been amended. No new matter has been added.

B. Conclusion

In light of the foregoing remarks, Applicants submit that all claims in the present case are in condition for allowance, and an early indication to that effect is earnestly solicited.

The Examiner is invited to contact the undersigned at (512) 536-3085 with any questions, comments or suggestions relating to the referenced patent application.

Respectfully submitted,



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